

What is claimed is:

1. A lightweight bearing in which at least an outer or inner bearing ring has fixing holes formed therein for fixing the ring to another member, the bearing ring comprising:

5 a main bearing ring member in which said fixing holes are formed, and a raceway surface formation member that is fixed to the main bearing ring member and forms a raceway surface on an inner peripheral surface or outer peripheral surface;

 the raceway surface formation member is formed of an
10 iron-based material, the main bearing ring member is formed of a lightweight material that is lighter than the iron-based material; and

 a hard plated coating is formed on surface portions of the main bearing ring member that form a seat for fasteners used in the fixing holes.

15 2. A lightweight bearing according to claim 1, wherein the plated coating is an electroplated or electroless coating of nickel or chromium.

 3. A lightweight bearing according to claim 2, wherein the plated coating is approximately 5 microns thick.

20 4. A lightweight bearing according to claim 1, wherein the lightweight material is an alloy of a light metal such as aluminum alloy or titanium alloy, or plastic, or ceramics.

 5. A lightweight bearing according to claim 1, in which the bearing ring is an outer ring;

25 the main bearing ring member is formed of aluminum alloy; and

 the raceway surface formation member comprised of an iron-based material is cast in the aluminum alloy and inserted into the main bearing ring member using pressing by shrink-fitting or the like to
30 unite the two members.

6. A lightweight bearing according to claim 1, in which the bearing ring is an inner ring;

the main bearing ring member is formed of titanium alloy;

and

5 forging is used to unite the raceway surface formation member formed of iron-based material with the main bearing ring member.

7. A lightweight bearing according to claim 1, wherein the bearing ring is an inner ring;

10 the main bearing ring member is formed of titanium alloy; and

the raceway surface formation member comprised of an iron-based material is cast in the titanium alloy and inserted into the main bearing ring member using pressing by shrink-fitting or the like to
15 unite the two members.

8. A lightweight bearing according to claim 1, wherein the bearing ring is an inner ring;

the main bearing ring member is formed of aluminum alloy;

and

20 forging is used to unite the raceway surface formation member formed of iron-based material with the main bearing ring member.

9. A wave gear drive, comprising:

25 a rigid internal gear; a flexible external gear located inside the internal gear; a wave generator located inside the internal gear; and a lightweight bearing according to claim 1 that couples the rigid internal gear and flexible external gear in a state in which there can be relative rotation between the internal gear and the external gear.

30 10. A wave gear drive according to claim 9, wherein the rigid internal gear comprises a main gear member and a circular teeth

formation member that is attached to the inner peripheral surface of the main gear member and has internal teeth formed on its inner peripheral surface; and

the teeth formation member is formed of an iron-based material and the main gear member is formed of a lightweight material that is lighter than the iron-based material.

11. A wave gear drive according to claim 9, wherein the wave generator comprises a rigid cam plate and a ball bearing disposed on the outer peripheral surface of the rigid cam plate; and

the rigid cam plate is formed of a lightweight material that is lighter than an iron-based material.

12. A wave gear drive according to claim 9, wherein the main gear member of the rigid internal gear has fixing holes formed therein to enable attachment to another member; and

the surface portion that seats fasteners used in the fixing holes is provided with a hard plated coating.

13. A wave gear drive according to claim 12, wherein the plated coating is an electroplated or electroless coating of nickel or chromium.

14. A wave gear drive according to claim 13, wherein the plated coating has a thickness within a range of 5 microns to 40 microns.

15. A wave gear drive according to claim 13, wherein the seat has a limit contact pressure that is at least approximately 25 kgf/mm².

16. A wave gear drive according to claim 9, wherein the lightweight material is an alloy of a light metal such as aluminum alloy or titanium alloy, or plastic, or ceramics.

17. A wave gear drive comprising:

a rigid internal gear; a flexible external gear located inside the internal gear; a wave generator located inside the internal gear; and a lightweight bearing configured to couple the rigid internal gear and flexible external gear in a state in which there can be relative rotation between the internal and external gears;

the rigid internal gear includes a main gear member, and a circular teeth formation member that is attached to the inner peripheral surface of the main gear member and has internal teeth formed on its inner peripheral surface, the teeth formation member being formed of an iron-based material and the main gear member being formed of a lightweight material that is lighter than the iron-based material;

the main gear member of the rigid internal gear has fixing holes formed therein to enable attachment to another member; and the surface portion that forms seats of fasteners used in the fixing holes has a hard-plate coating.

18. A wave gear drive according to claim 17, wherein the plated coating is an electroplated or electroless coating of nickel or chromium.

19. A wave gear drive according to claim 18, wherein the plated coating has a thickness within a range of 5 microns to 40 microns.

20. A wave gear drive according to claim 17, wherein the seat has a limit contact pressure that is at least approximately 25 kgf/mm².

21. A wave gear drive according to claim 17, wherein the wave generator includes a rigid cam plate and a ball bearing disposed on an outer peripheral surface of the rigid cam plate, the rigid cam plate being formed of a lightweight material that is lighter than an iron-based material.

22. A wave gear drive according to claim 17, wherein the lightweight material is an alloy of a light metal such as aluminum alloy or titanium alloy, or plastic, or ceramics.